

REMARKS

This Amendment is in response to the first Office action (Paper No. 20070320) mailed on 27 March 2007. Reexamination and reconsideration are respectfully requested.

Listing of The Claims

Pursuant to 37 CFR §121(c), the claim listing, including the text of the claims, will serve to replace all prior versions of the claims, in the application.

Status of The Claims

Claims 1 through 18 are pending in this application.

Amendment of The Claims

Claims 1 through 4, 6 through 9, 11 through 13, 15 through 18 are amended.

Specifically,

- claim 4 is amended into independent form to incorporate claims 1 and 2, and claim 3 is amended to be dependent on claim 4;
- claim 9 is amended into independent form to incorporate claims 6 and 7, and claim 8 is amended to be dependent on claim 9;
- claim 13 is amended into independent form to incorporate claims 11 and 12; and
- claim 17 is amended into independent form to incorporate claims 15 and 16.

Issues Raised by Paper No. 20070320

Claim Objections

I. Objections of Claims 1-5, 8-10, 17, and 18.

Claims 1-5, 8-10, 17, and 18 are objected.

I-1. Claim 1

Regarding claim 1, on page 2 of the Office action (Paper No. 20070320), the Examiner stated that “regarding claim 1 line 18, the second occurrence of ‘PPP frame data’ seems to refer to ‘PPP frame data’ previously recited in claim 1 line 2; if this is true, it is suggested to rewritten [*sic.*, “rewriting”] the second ‘PPP frame data’ as — the PPP frame data —.”

The Examiner’s careful examination is highly appreciated. The “PPP frame data” in claim 1 line 18, however, does not refer to the “PPP frame data” in claim 1 line 2. Specifically, the “PPP frame data” in claim 1 line 18 is a general term which refers to all the PPP data received from the base transceiver station; while the “PPP frame data” in claim 1 line 2 specifically refers to the PPP frame data received by the network controller and which is to be de-framed by the deframing method.

Therefore, the “PPP frame data” in claim 1 line 18 will not be revised.

I-2. Claim 8

Regarding claim 8, on page 2 of the Office action (Paper No. 20070320), the Examiner stated that “regarding claim 8 line 3 the second occurrence of ‘reception of all PPP frame data’ seems to refer to ‘reception of all PPP frame data’ previously recited in claim 6 line 23; if this is true, it is suggested to rewritten [*sic.*, “rewriting”] the second ‘reception of all PPP frame data’ as — the

reception of all PPP frame data—.”

Accordingly, the ‘reception of all PPP frame data’ in claim 8 line 3 will be amended to read “the reception of all PPP frame data”.

I-3. Claim 17

Regarding claim 17, on page 2 of the Office action (Paper No. 20070320), the Examiner stated that “regarding claim 17 line 10 the second occurrence of ‘PPP packet data’ seems to refer to ‘PPP packet data’ previously recited in claim 6 line 23; if this is true, it is suggested to rewritten [*sic.*, “rewriting”] the second ‘PPP packet data’ as — the PPP packet data—.”

Accordingly, the ‘PPP packet data’ in claim 8 line 3 will be amended to read “the PPP packet data”.

I-4. Claim 18

Regarding claim 18, on page 3 of the Office action (Paper No. 20070320), the Examiner stated that “regarding claim 18 line 2 the recitation ‘inserting unit’ should be rewritten as —an inserting unit —.”

Accordingly, the ‘inserting unit’ in claim 18 line 2 will be amended to read “an inserting unit”.

Claim Rejections - 35 U.S.C. §102

II. Rejection of Claims 1, 6, 11 and 15 under 35 U.S.C. §102(e) as being anticipated by Jain et al. (U.S. 2003/0081582).

Claims 1, 6, 11 and 15 are rejected under 35 U.S.C. §102(e) as being anticipated by Jain et

al. (U.S. 2003/0081582).

II-1. The present invention relates to a packet data processing apparatus which processes packet data in a Packet Data Serving Node (PDSN). In the apparatus, a separate hardware configuration of a PDSN, i.e., an IP frame generator, performs de-framing and de-stuffing for a Point-to-point Protocol (PPP) frame provided from a Base Transceiver Station (BTS), thereby generating an IP frame, and then outputs the generated IP frame to the Internet network. Further, another separate hardware configuration of the PDSN, i.e., a PPP frame generator, frames and stuffs an Internet Protocol (IP) frame transferred from Internet, thereby generating a PPP frame, and then transfers the generated PPP frame through the BTS to a corresponding Mobile Station (MS). Therefore, processing speed of a line card performing interfacing with the BTS, and the performance of the entire PDSN can be improved. Moreover, problems due to data processing are prevented from being caused, since many functions in relation to PPP have been realized by hardware.

Jain '582 relates to aggregating multiple wireless communication channels for high data rate transfers. A mobile wireless terminal (MWT) receives IP packets destined for a ground network in a predetermined sequence order. The MWT fragments each of the IP packets into many smaller packet fragments, appends identifying information to each of the packet fragments, and transmits the packet fragments in parallel with one another over concurrently operating satellite channels. A receiving station receives the packet fragments transmitted by the MWT. The receiving station forwards the received packet fragments to a ground controller over a network connection, based on the identifying information appended to the packet fragments. The ground controller combines the packet fragments into reconstructed IP packets based on the identifying information appended to the

fragments. The ground controller also sequences the reconstructed IP packets in the predetermined sequence order based on the identifying information. The controller forwards the reconstructed IP packets in the correct sequence order to the destination ground network. The same sequence of events occur in the opposite direction as well i.e., from the ground controller to the MWT.

The pending claims are patentably distinguishable from Jain '582 because of the following reasons.

First, in the pending claims, the IP frame generator and the PPP frame generator being hardware modules separate from each other, while in Jain '582, the fragmenter and the defragmenter are included in the same controller module 1402.

Secondly, the pending claims claim storing the PPP frame data and reassembling information in a packet memory, and reading the PPP frame data and reassembling information from that packet memory, while there is no disclosure regarding a memory in Jain '582.

Thirdly, in the present invention, the data transmitted between the base transceiver station and the packet data serving node conforms to a point-to-point protocol, and the data transmitted between the packet data serving node and the end host conforms to an internet protocol; while in Jain '582, the data packet transmitted between the data network and the mobile wireless terminal, and between the mobile wireless terminal and the ground controller conforms to an internet protocol.

II-2. Claim 1

II-2-1. Claim 1 is further amended to add the following passage:

“the packet data serving node further comprising a PPP frame generator for converting the IP packet data received from the host into a plurality of pieces of PPP frame

data, with the PPP frame generator and the IP frame generator being hardware modules separate from each other.”

This part is supported by the disclosure as filed:

paragraph [0046], “Specifically, in the present invention, **the PPP framing and de-framing, byte stuffing, and byte de-stuffing functions of a PDSN are realized by hardware instead of software**, so that performance of an interface line card constituting the PDSN is improved, a much higher speed packet processing system supporting a high speed interface between an MS and the PDSN can be manufactured, and the WAG function between the MS and the Internet network can be more stably realized”;

paragraph [0054], “As shown in FIG. 5, the PDSN 109 includes a PPP frame generator 230, which performs PPP framing and byte stuffing, and an IP frame generator 240, which performs PPP de-framing and byte de-stuffing, in addition to the configuration of the PDSN as described above with reference to FIG. 2”; and

paragraph [0055], “The PPP frame generator 230 and the IP frame generator 240 are connected with the network controller 212 through a predetermined bus for the cooperation with the above-described configuration of FIG. 2”.

In contrast, Jain ‘582 fails to disclose that the fragmenter and the defragmenter are provided in different hardware modules. See the cited passages of Jain ‘582:

paragraph [0131], “Controller 1400 includes the following controller modules for executing the methods of the present invention”; and

paragraph [0132], “a fragmenter/defragmenter 1402 to fragment IP packets into packet fragments in the transmit direction and de-fragment (or assemble) such packet fragments into reconstructed IP packets in the receive direction”.

Therefore, in Jain ‘582, the fragmenter and the defragmenter are included in the same controller module 1402, and the fragmenter and the defragmenter are not separated from each other.

II-2-2. Regarding claim 1, on page 3 of the Office action (Paper No. 20070320), the Examiner stated that Jain ‘582 discloses a deframing method comprising “storing the PPP frame data

in a packet memory in dependence upon the session number, and storing reassembling information corresponding to the session number (see paragraph 106 and 137, sequencer acts as a memory by storing out-of-order packets and re-sequence them in order based on the sequence ID), the receiving and the storing of the PPP frame data and the storing of the reassembling information being performed by a network controller (see paragraph 137, a sequencer is a part of the controller)". Applicant respectfully disagrees with this assertion.

Respectfully, the Examiner incorrectly presumes that the sequencer in Jain '582 may act as a memory. A thorough reading of Jain '582 reveals that in Jain '582, a plurality of IP packet fragments may be reconstructed into an IP packet. Subsequently, a plurality of reconstructed IP packets may be sequenced into an IP packet sequence. The sequencer in Jain '582 merely functions to sequence the reconstructed IP packets, that has been reconstructed by recombining the IP packet fragments based on the fragment IDs, in the predetermined IP packet sequence order. See the cited paragraph from Jain '582:

paragraph [0137], "a sequencer/demultiplexer 1414 to **sequence reconstructed IP packets** (and packet fragments) in accordance with the packet sequence ID appended to each packet fragment".

There is no disclosure in Jain '582 regarding storing the PPP frame data and reassembling information in the packet memory.

In addition, there is no disclosure in Jain '582 that a controller may function to receive and store PPP data and reassembling information.

II-2-3. Regarding claim 1, on page 4 of the Office action (Paper No. 20070320), the Examiner stated that Jain '582 discloses a deframing method comprising "when the receiving has

been completed, reading the PPP frame data from the packet memory (see paragraphs 105 and 131, a sequencer which acts as a memory is a part of the controller) and reassembling the read PPP frame data into one integrated piece of PPP packet data (see paragraphs 106)". Applicant respectfully disagrees with this assertion.

Respectfully, the Examiner incorrectly presumes that the sequencer may act as a memory. In fact, the sequencer in Jain '582 merely functions to sequence the reconstructed IP packets, that has been reconstructed by recombining the IP packet fragments based on the fragment IDs, in the predetermined IP packet sequence order. See the cited passage in Jain '582:

paragraph [0110], "At a next step 1006, the ground controller 232 sequences the plurality of reconstructed IP packets in the predetermined IP packet sequence order based on the packet sequence IDs. This includes re-ordering reconstructed packets when the reconstructed packets are out-of-order with respect to the predetermined sequence order established at mobile portion 202, as indicated by the sequence IDs. "

There is no disclosure in Jain '582 regarding reading the PPP frame data from the packet memory, and reassembling the PPP frame based on the reassembling information stored in the packet memory. In addition, there is no disclosure in Jain '582 that the sequencer may acts as a memory.

II-2-4. Regarding claim 1, on page 4 of the Office action (Paper No. 20070320), the Examiner stated that Jain '582 discloses that "the point-to-point protocol deframing processor and network controller being included in a packet data serving node in a mobile communication system (see paragraph 131, the controller includes a sequencer and a fragmenter/defragmenter)". Applicant respectfully disagrees with this assertion.

Respectfully, there is no disclosure in Jain '485 that the sequencer has the similar function of the network controller of claim 1 to read and store the PPP frame data and the reassembling

information.

In addition, there is no disclosure in Jain '485 regarding a packet data serving node.

II-2-5. Regarding claim 1, on page 4 of the Office action (Paper No. 20070320), the Examiner stated that Jain '582 discloses that "the packet data serving node connected with the base transceiver station through general routing encapsulation tunneling based on the point-to-point protocol (see paragraph 100, PPP headers are added to packet fragments)". Applicant respectfully disagrees with this assertion.

Respectfully, there is no disclosure in Jain '582 regarding the general routing encapsulation tunneling between the packet data serving node and the base transceiver station. According to Wikipedia (http://en.wikipedia.org/wiki/Generic_routing_encapsulation),

"Generic Routing Encapsulation (GRE) is a tunneling protocol designed to encapsulate a wide variety of network layer packets inside IP tunneling packets".

Jain '582 merely discloses adding PPP headers to IP packet fragments. Jain '582 does not teach or suggest any tunneling protocol. Therefore, it is not appropriate to assert that the IP packet with PPP header is transmitted through general routing encapsulation tunneling based on the point-to-point protocol.

II-2-6. According to MPEP §2131:

"A claim is anticipated only if **each and every** element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Jain '582 does not disclose claim 1's separator PPP frame generator and IP frame generator, or storing the PPP frame data and reassembling information in a packet memory, or reading the PPP

frame data and reassembling information in a packet memory, or general routing encapsulation tunneling, or converting PPP frame data to IP packet. Therefore, the pending claim 1 is patentably distinguishable from Jain '582.

II-3. Claim 6

Regarding claim 6, on page 5 of the Office action (Paper No. 20070320), the Examiner stated that "claim 6 is rejected for the same reason as claim 1, since claim 6 is an apparatus carrying out the method of claim 1".

Respectfully, since claim 6 is an apparatus carrying out the method of claim 1, for the same reason as stated in Section II-2, Jain '582 does not disclose claim 6's separator PPP frame generator and IP frame generator, or general routing encapsulation tunneling, or a network controller receiving and storing the PPP frame data and reassembling information in a packet memory, or reading the PPP frame data and reassembling information stored in the packet memory by the IP frame generator. Therefore, the pending claim 6 is patentably distinguishable from Jain '582.

II-4. Claim 11

II-4-1. Claim 11 is amended to add the following passage:

"the packet data serving node further comprising an IP frame generator for converting the PPP frame data received from the base transceiver station into IP packet data, with both the IP frame generator and the PPP frame generator being hardware modules separate from each other".

As explained in section II-2-1, Jain '582 fails to disclose that the fragmenter and the defragmenter are provided in different hardware modules.

II-4-2. Regarding claim 11, on page 5 of the Office action (Paper No. 20070320), the

Examiner stated that Jain '582 discloses a framing method comprising “storing PPP packet data and control information corresponding to the PPP packet data in a packet memory (see paragraphs 106 and 137, sequencer acts as a memory by storing out-of-order packets and re-sequence them in order based on the sequence ID), the storing being performed by a network controller (see paragraph 137, a sequencer is a part of the controller)”. Applicant respectfully disagrees with this assertion.

The Examiner incorrectly presumes that the sequencer in Jain '582 may act as a memory. The sequencer in Jain '582 merely functions to sequence the reconstructed IP packets, that has been reconstructed by recombining the IP packet fragments based on the fragment IDs, in the predetermined IP packet sequence order. See the cited paragraph from Jain '582:

paragraph [0137], “ a sequencer/demultiplexer 1414 to **sequence reconstructed IP packets** (and packet fragments) in accordance with the packet sequence ID appended to each packet fragment”.

There is no disclosure in Jain '582 regarding storing the PPP packet data and control information corresponding to the PPP packet data in the packet memory.

In addition, there is no disclosure that a controller may function to storing PPP packet data and control information.

II-4-3. Regarding claim 11, on page 6 of the Office action (Paper No. 20070320), the Examiner stated that Jain '582 discloses “the plurality of pieces of PPP frame data including a first piece of PPP frame data and a last piece of PPP frame data, with a start flag being inserted into the first piece of PPP frame data and an end flag being inserted into the last piece of PPP frame data (see paragraph 80, a fragment header includes a fragment ID, which includes a start and end flag)”. Applicant respectfully disagrees with this assertion.

Respectfully, Jain '582 does not disclose an end flag. Jain '582 merely discloses adding a fragment header to each packet fragment and the fragment header includes a fragment ID which identifies the fragment within the IP packet with respect to the other packet fragments belonging to the IP packet. See the cited paragraph from Jain '582:

paragraph [0080], "controller 214 adds a fragment header to each packet fragment. The fragment header includes a fragment ID and an IP packet sequence ID. The fragment ID identifies the fragment within the IP packet with respect to the other packet fragments belonging to the IP packet".

Therefore, the fragment ID is added as a header to each packet fragment. And there is no disclosure that a start flag is inserted into the first piece of PPP frame data and an end flag is inserted into the last piece of PPP frame data, as claimed in claim 11.

II-4-4. Regarding claim 11, on page 6 of the Office action (Paper No. 20070320), the Examiner stated that Jain '582 discloses "the packet data serving node connected with the base transceiver station through general routing encapsulation tunneling based on the point-to-point protocol (see paragraph 100, PPP headers are added to packet fragments)". Applicant respectfully disagrees with this assertion.

Respectfully, there is no disclosure in Jain '582 regarding the general routing encapsulation (GRE) tunneling between the packet data serving node and the base transceiver station. Jain '582 merely discloses adding PPP headers to IP packet fragments. But it is not appropriate to assert that the IP packet with PPP header is transmitted through general routing encapsulation tunneling based on the point-to-point protocol.

II-4-5. According to MPEP §2131:

“A claim is anticipated only if **each and every** element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Jain ‘582 does not disclose claim 11’ s separate PPP frame generator and IP frame generator, or storing the PPP frame data and control information in a packet memory, or a start flag and an end flag, or general routing encapsulation tunneling. Therefore, the pending claim 11 is patentably distinguishable from Jain ‘582.

II-5. Claim 15

Regarding claim 15, on page 7 of the Office action (Paper No. 20070320), the Examiner stated that “claim 15 is rejected for the same reason as claim 11, since claim 15 is an apparatus carrying out the method of claim 11”.

Respectfully, since claim 15 is an apparatus carrying out the method of claim 11, for the same reason as stated in Section II-4, Jain ‘582 does not disclose claim 15’s separate IP frame generator and PPP frame generator, or storing the PPP frame data and control information in a packet memory, or an end flag, or general routing encapsulation tunneling. Therefore, the pending claim 15 is patentably distinguishable from Jain ‘582.

In view of the foregoing amendments and remarks, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. If there are any questions, the examiner is asked to contact the applicant’s attorney.

A fee of \$800.00 is incurred by this Amendment for addition of four (4) independent claims in excess of 4. Applicant's check drawn to the order of the Commissioner accompanies this Amendment. Should there be a deficiency in payment, or should other fees be incurred, the Commissioner is authorized to charge Deposit Account No. 02-4943 of Applicant's undersigned attorney in the amount of such fees.

Respectfully submitted,



Robert E. Bushnell
Attorney for the Applicant
Registration No.: 27,774

1522 "K" Street N.W., Suite 300
Washington, D.C. 20005
(202) 408-9040

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